Self-coaching tools for conducting responsible research and innovation (RRI) with social robots

International Workshop at the

Eleventh International Conference

on Social Robotics

Tuesday, 26th of November, 2019

Book of abstracts and presentations

Organizers: Dr. Laura Aymerich-Franch (Ramón y Cajal Fellow at Pompeu Fabra University), Dr. Eduard Fosch-Villaronga (Marie Sklodowska-Curie Postdoctoral Researcher at Leiden University), and Prof. Amparo Grau (Professor at Universidad Complutense de Madrid).

With the support of:

Contents

Presentation

Dr. **Laura Aymerich-Franch**, Ramón y Cajal Researcher at Pompeu Fabra University in collaboration with Dr. **Eduard Fosch-Villaronga**, Marie Sklodowska-Curie Postdoctoral Researcher at the eLaw Center for Law and Digital Technologies of Leiden University, appointed expert by the European Commission to the Sub-Group on Artificial Intelligence (AI), connected products and other new challenges in product safety to the Consumer Safety Network (CSN) and **María Amparo Grau Ruiz**, Professor of Financial and Tax Law, leader of the H2020 project INBOTS WP2 on ELSE issues and the team at the University Complutense and Principal Investigator of CertificaRSE Project, organized a workshop on "Self-coaching tools for conducting responsible research and innovation (RRI) with social robots" within the Eleventh International Conference on Social Robotics (ICSR2019).

Currently, there is a growing awareness on the importance of RRI. The European institutions are trying to boost its implementation through several research projects (e.g. INBOTS and RRING). Other international organizations such as UNESCO are working in this field too at a global scale. After years of discussion, the concept of RRI seems quite clear, but the main problem is how to put it into practice. A series of obstacles can be found, very different in nature (political will, economic costs, lack of an organizational structure to support the change, among others).

The intention of this workshop was to address this critical situation and provide some useful hints on different ways to advance the solution, mainly by self-learning, or learning by doing. Tools like coaching, even the sound application of tax incentives, or the adaptation of business structure to compliance are venues to explore. Some experiences showing us the attempts for global reach and the care for the most vulnerable can inspire other future efforts always welcome in this ambit.

The **welcome and opening** speech of this workshop held at Universidad Carlos III de Madrid, on the 26th of November 2019, was given by Dr. **Laura Aymerich-Franch** and Dr. **Eduard Fosch-Villaronga**.

The **First Panel** was composed of the following presentations: "Self-coaching tools for conducting responsible research and innovation (RRI) with social robots" by **Eduard Fosch-Villaronga**, Marie Sklodowska-Curie Postdoctoral Researcher at Leiden University; "Responsible Research and Innovation for Global Sustainability" by **Juliana Chaves Chaparro**, member of the RRING project, environmental scientist working as consultant on STI policies and Responsible Research and Innovation in UNESCO; "Towards a governance of Artificial Intelligence and Robotics" by **Helena Ancos Franco**, INBOTS - Ansari Innovación Social; and "Tax incentives as a way to promote

RRI in robotics" by **Álvaro Falcón Pulido**, INBOTS - PhD Candidate at Universidad Complutense de Madrid on Tax and Robots.

The **Second Panel** was composed of the following presentations: "Towards inclusive design, exploring dementia-friendly hospital design in Canada" by **Mohamad Nadim Adi**, member of the RRING project, Department of Interior Architecture and Environmental Design at Bilkent University; "Self-guidance techniques to conduct RRI based on auto-coaching: The art of asking the right questions to find the right answers" and a Group Brainstorming sesion: "Roadmap for RRI & social robots", which was based on the previous technique, by **Laura Aymerich-Franch**, a Ramón y Cajal Researcher at Pompeu Fabra University.

The **take-away message and closing remarks** were made by **Laura Aymerich-Franch** and **Eduard Fosch-Villaronga.**

Further information on the event can be found on the following websites:

http://icsr2019.uc3m.es/index.html

https://sites.google.com/view/sc-rri/home

Finally, the organizers want to express their gratitude to all the speakers for their contibutions to this Workshop, and to Álvaro Falcón Pulido for his help in the edition of this Eprint UCM.

Dr. Laura Aymerich-Franch, Dr. Eduard Fosch-Villaronga, and Prof. María Amparo Grau Ruiz.

ACKNOWLEDGMENTS

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It has also has been funded with the European Union's Horizon 2020 research and innovation program under Grant agreement No. 780073 INBOTS, through Prof. Grau Ruiz.

This workshop has additionally received financial support from the CertificaRSE project "Legal-Financial Effects, And Control Of The Social Impact For Sustainable Development: The Role Of Labels In The Investment And In The Public Contracts' (DER2015-65374-R MINECO-FEDER)" through Prof. Grau Ruiz.

Further information on research projects can be found on the following institutional websites:

http://inbots.eu

https://www.ucm.es/proyecto-certificarse/

https://leadingfellows.eu/

Program

9:00 Opening

"The importance of conducting responsible research with social robots"

9:15 Self-coaching tools for conducting responsible research and innovation (RRI) with social robots

Eduard Fosch-Villaronga, Marie Sklodowska-Curie Postdoctoral Researcher

9:35 Responsible Research and Innovation for Global Sustainability

Juliana Chaves Chaparro, RRING, environmental scientist working as consultant on STI policies and Responsible Research and Innovation in UNESCO

9:55 Towards a governance of Artificial Intelligence and Robotics

Helena Ancos Franco, INBOTS, Ansari Innovación Social

10:15 Tax incentives as a way to promote RRI in robotics

Álvaro Falcón Pulido, INBOTS, PhD Candidate at Universidad Complutense de Madrid on Tax and Robots

10.35 Q&A

10:45 Coffee Break

11:15 Towards inclusive design, exploring dementia-friendly hospital design in Canada

Mohamad Nadim Adi (Virtual Talk), RRING, Department of Interior Architecture and Environmental Design at Bilkent University

11:35 Self-guidance techniques to conduct RRI based on auto-coaching: The art of asking the right questions to find the right answers

Laura Aymerich-Franch, Ramón y Cajal Senior Research Fellow Pompeu Fabra University

11:50 Group Brainstorming session

Roadmap for RRI & social robots (based on the previous technique)

12:50 Take-away message & closing remarks

Abstracts

LAURA AYMERICH-FRANCH, EDUARD FOSCH-VILLARONGA, and AMPARO GRAU

(Slides of the presentation on page 16)

Self-coaching tools for conducting responsible research and innovation (RRI) with social robots

Innovating is about creating and transforming the future of society. However, to ensure a desirable future for humanity, innovation needs to be responsible. In this respect, there are frameworks such as the Responsible Research and Innovation (RRI) that guide all the societal actors involved in research and innovation (R&I) processes towards reflecting upon the consequences of their research for society.

In this sense, responsible innovation is "an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation" (EC, 2019).

R&I processes conducted from the lens of RRI are guided by the principles or dimensions of inclusion, anticipation, reflection, responsiveness, and transparency. These five principles that define RRI provide a suitable framework for conducting research and innovating responsibly in any area of R&I, including social robots.

Authors information

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Dr. Eduard Fosch-Villaronga, Marie Sklodowska-Curie Postdoctoral Researcher at Leiden University, e.fosch.villaronga@law.leidenuniv.nl.

JULIANA CHAVES CHAPARRO

(Slides of the presentation on page 20)

Responsible Research and Innovation for Global Sustainability

At the European level, the Responsible Research and Innovation approach tries to foster social engagement, ethics, open access, science education, and gender equality through better governance of Science, Technology, and Innovation (STI). The RRING project tries to monitor RRI advancements in all regions adding to these pillars cultural and contextual aspects to link up RRI to the global world. It also aims at building a knowledge database supporting RRI competitive advantage in the 4 targeted sectors (including ICTs) and efficiency towards SDG´s attainment (WP 6 lead by UNESCO). However, the translation from policy to practice, grounding RRI approach in research institutions is not a simple task as it requires transforming mindsets of researchers and innovators. The GRRIP project will self-assessed institutions, co-develop and implement RRI Action Plans in 5 Marine and Maritime RPOs (including PLOCAN in Spain) to promote mutual learning on institutional and cultural change.

The lessons and experiences from these two European projects can serve to showcase advantages, limitations, and challenges of the RRI approach in other high public interest attractive sectors as robotics.

Author information

Ms. Juliana Chaves-Chaparro, Environmental scientist working as consultant on STI policies and Responsible Research and Innovation in UNESCO, j.chaves-chaparro@unesco.org.

HELENA ANCOS FRANCO

(Slides of the presentation on page 30)

Towards a governance of Artificial Intelligence and Robotics

The future of our society depends on finding the right balance between technological development and human rights protection. The international framework for protecting human rights could be applied against discriminatory impacts caused by robotics and AI. States should take targeted measures to ensure that discrimination in the exercise of rights is eliminated, and regularly assess whether the measures chosen are effective in practice.

The assumption that the design, deploying machine learning systems, development and use of responsible technology is a shared responsibility by the States and private actors has led to the setting of Codes of Ethics and standards under the auspices of several organizations, such as the Toronto Declaration. However, the more effective way for promoting a solid protection for future robotics and AI concerns, relies at a firm level, and specially, through the design of a compliance system in line with other existing compliance systems in corporate governance and according to the principles and values of Corporate Social Responsibility.

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ÁLVARO FALCÓN PULIDO

(Slides of the presentation on page 41)

Tax incentives as a way to promote RRI in robotics

Tax incentives are often used for extra-fiscal purposes, and can be used to promote responsible research and innovation in robotics. We have to explore the possibility of conditioning tax incentives for research and development to an obligation to carry them out with an approach that anticipates and assesses their potential implications in line with societal expectations. These fiscal tools can be a sort of transitional measures to correct the technological gap experienced by some workers by improving their training, making them participate in some of the profits derived from the use of robots and also protecting their jobs.

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MOHAMAD NADIM ADI

(Slides of the presentation on page 46)

Towards inclusive design, exploring dementia-friendly hospital design in Canada

Architecture is traditionally associated with stability, sturdiness, and anchoring, but it is more than a container protecting users from the elements. It is a place that influences the state of mind and productivity of those within it. With the advancement of technology, it is now possible to use virtual reality to investigate the impact of different designs on users' performance and safety; without compromising the safety of its users or incurring the expense of a building. Simulation in architectural design can assess the effect of different design aspects on users' responses and performance by exposing test subjects to different design scenarios using virtual reality. Virtual reality can be used in different building and design types ranging from workspaces to hospitals by reviewing existing literature and performing live experiments to assess the reaction of users to such spaces. It is our belief that inclusive design should cover all groups within society and that with more focus on one of the most vulnerable groups in society, people with dementia, we can build a better and more efficient architecture that can actively contribute to healing.

Author information

Mohamad Nadim Adi, Assistant professor in VR and Architectural design in Bilkent University in Ankara, Turkey.

LAURA AYMERICH-FRANCH

(Slides of the presentation on page 53)

Self-guidance techniques to conduct RRI based on auto-coaching: The art of asking the right questions to find the right answers

One of the most challenging aspects of being able to put into practice these principles is HOW TO specifically implement them in everyday R&I practices.

Lessons learned

First, we will hear the experience from the participants: How do you implement the RRI goals in your research project?

Self-Coaching techniques

Following the basic Coaching principle that finding the right answers is about asking the right questions, we provide a hands-on approach half-day workshop session in which participants will first learn a series of self-coaching techniques that can be used as self-guidance tools to lead R&I processes throughout all the stages, from the conception of the project to the final implementation or publication. These self-guidance tools that participants will learn and practice during the session have been designed by the organizers themselves.

Shared Guidelines

Next, participants and organizers will together produce a series of guidelines for conducting responsible research and innovation in the area of social robots based on the learnt techniques. We expect that the guidelines will be useful not only to participants but to the whole R&I community that work with social robots for conducting responsible R&I.

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Materials

LAURA AYMERICH-FRANCH, EDUARD FOSCH-VILLARONGA, and AMPARO GRAU

Self-coaching tools for conducting responsible research and innovation (RRI) with social robots

Dimensions

Inclusion

Anticipation

Reflection

Responsiveness

Transparency

Inclusion

The principle of inclusion is concerned with conducting research not only for society but *with* society and thus involving a wide range of stakeholders from the early stages of the R&I process "both for normative democratic reasons and to broaden and diversify the sources of expertise, disciplines and perspectives" (Kupper et al., 2015).

Anticipation

Anticipation is about encouraging social actors involved in R&I processes to ask "**what if**" questions so that they envision contingency plans towards potential outcomes, build socially-robust risk-free research, and unveil hidden opportunities (Stilgoe, Owen, & Macnaghten, 2013).

Reflection

Reflexivity encourages researchers to **think mindfully** about their work. Rethinking prevailing assumptions, values, and purposes in current R&I practices and activities may help raise awareness of the importance of framing issues, problems, and suggested solutions.

Responsiveness

RRI can reshape R&I processes in response to circumstances that no longer align with the continually evolving needs of society (Stilgoe, Owen, & Macnaghten, 2013). Responsiveness alludes to the **flexibility and capacity to change R&I processes to ensure the research enforces public values**.

Transparency

Transparency encourages **open-access** dissemination of the results and conclusions, enabling this way public scrutiny and dialogue.

JULIANA CHAVES CHAPARRO

Responsible Research and Innovation for Global Sustainability

Natural Sciences Sector

United Nations Educational, Scientific and Cultural Organization

UNESCO Science for Sustainable Development

Responsible Research and Innovation for Global Sustainability

Juliana Chaves Chaparro, Project officer
Section for Research, Policy and Foresight
UNESCO Sector for Social and Human Sciences

Natural Sciences Sector

United Nations Educational, Scientific and Cultural Organization

UNESCO Science for Sustainable Development

The World Today- The need for new Science and innovation

- Local decisions-global impact- **Globalized Knowledge open access, exchange networks, transparency**
- Facing climate changes: unexpected and probability of more extreme events (**Uncertainty)- Anticipatory**
- Population increase – **(pressure)- responsive, action driven**
- Global crisis: food, energy and financial - (**poverty) interdiscisplinary, reflexive**
- Where knowledge and technology is more and more important- (**Inequalities)- Inclusive, gender**

= RRI Principles

2

Why UNESCO ? Sciences (also SHS), ED , culture and communication agency
Priority Gender, Youth and Africa

The six Pillars of RRI:

- RRI needs policy institutional and cultural change

Why UN ? Why UNESCO (Science, ED agency)

-The Universal Declaration of **Human Rights** (**article** 27) affirms everyone's **right** to participate in and benefit from **scientific advances**, and be protected from **scientific** misuses. This implies that the benefits of scientific advancement should be shared openly, free from restrictions by social groups, corporate entities or states. Above all, a rights-based approach to science seeks to create the conditions for equitable participation in the global science community and fair access to scientific information and goods.

Natural Sciences Sector

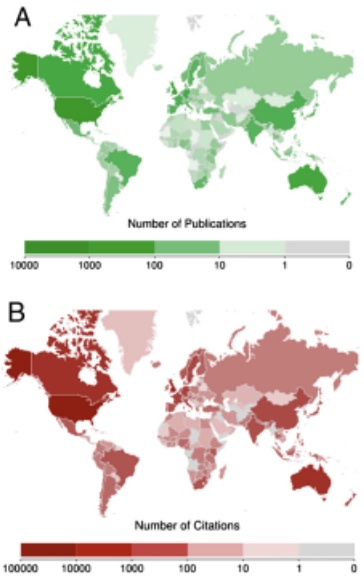
United Nations Educational, Scientific and Cultural Organization

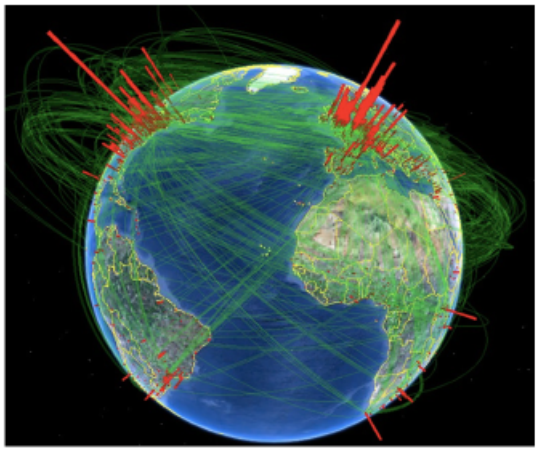
UNESCO Science for Sustainable Development

RRI

-2017 UNESCO Recommendation on Science and Scientific Researchers (1974) protect researchers careers, freedom with a renewed emphasis on scientific integrity and ethical codes of conduct for science and research and their technical applications. support implementation and monitoring

Poverty and inequalities biggest barriers for SDG´s





Africa is the less connected region within the Production of Sustainable Science New Knowledge

Responsability at the global level : RRING project

- *RRI anticipates and assess potential implications and societal expectations with regards to R&I, with the aim to foster the design of inclusive and sustainable R&i:* Support to SDGs and national development agendas

- RRI approach has to embed regional and contextual specificities and understandings
  - Integrated goals for global sustainability based on scientific evidence
  - Mechanisms to facilitate an interactive, inclusive, equal dialogue on global responsibility among the various regions, stakeholders and the policy-making community at different scales, different mechanisms

UNESCO and RRI

- The World Commission on the Ethics of Scientific Knowledge and Technology and its Ethics Observatory (GEObs)
- Monitoring of Social Transformation Program (MOST)
- Global Observatory of STI policies
- Promote Gender in Science-LOREAL, SAGA
  - IUS-statistics and periodic global reports on Science, Education or Social sciences.-
  - Global open access portal : status of OA in 158 countries

RRING

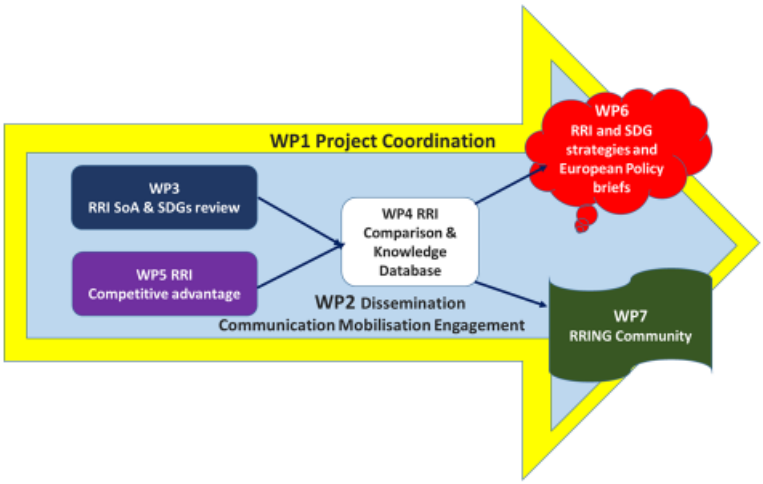
3 MEUR February 2019-February 2021

www.ring.eu

RRING 5 Objectives

1. Creating the global RRING community network (JOIN uS!)
2. Create a State of the Art (SoA) by 5 UN regions and global open access knowledge base of RRI (and conceptualizations)
   Open until 20.12.2019 http://www.rring.eu/survey/
3. Aligning, comparing and making policy recommendations on how to cross-adapting RRI to the UN Sustainable Development Goals (UNESCO lead)- co-develop RRI strategies and roadmaps for 2 EU countries
4. Determine the competitive advantages of RRI (survey open until 20.12 for enterprises and policy makers)
5. Create high level RRI policy strategy recommendations for the five geographic zones.

RRING project Workpackages



This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant no 788503

HOW to embed RRI in R&I practice? (Category I and II centers; innovation parks, policy instruments)

GRRIP: Grounding RRI practices in research performing organisations

- GRRIP will embed sustainable RRI practices in 5 Marine and Maritime centres
  - 4 research performing organisations (RPO) and
  - 1 dual function RPO and research funding organisation (RPO/RFO)

- M&M Centres getting action plans are:
  - MaREI, University college Cork, Ireland
  - Plocan, Gran Canaria
  - Wavec, Lisbon, Portugal
  - EC Nante, France
  - Swansea University, Wales

1: Co-develop, implement and evaluate self-tailored RRI APs. The APs will be based on a detailed audit of the RPO&RFO current RRI maturity level and the barriers identified.

2: Establish structures to facilitate, promote and maximise real sustainable engagement with, and input from, the QH (industry, societal actors, policy and other RPO&RFOs).

3: Establish indicators and methodology for impartial Monitoring, Reflection and Evaluation cycles

4: Develop a sustainable Mutual Learning process across the M&M RPO&RFOs both during the institutional and cultural change project and thereafter.

5: Legacy: a) creating a practical user-friendly RRI AP framework template & guidelines, and b) launching a M&M RRI community.

6: Examine how an RFO can positively influence and encourage an RPO towards RRI via its funding policy and interaction.

RRING GRRIP
This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant no 788503

- GRRIP WP

WP1: Project Coordination, Standardisation and Methodology

WP2: Dissemination, Exploitation and Communication

WP3: Statement of the Art on RRI Action Plans and QH dialogue platforms- UNESCO
State of the Art on RRI in research organizations to identify the most successful initiatives, projects and methods that have generated institutional change and QH engagement.

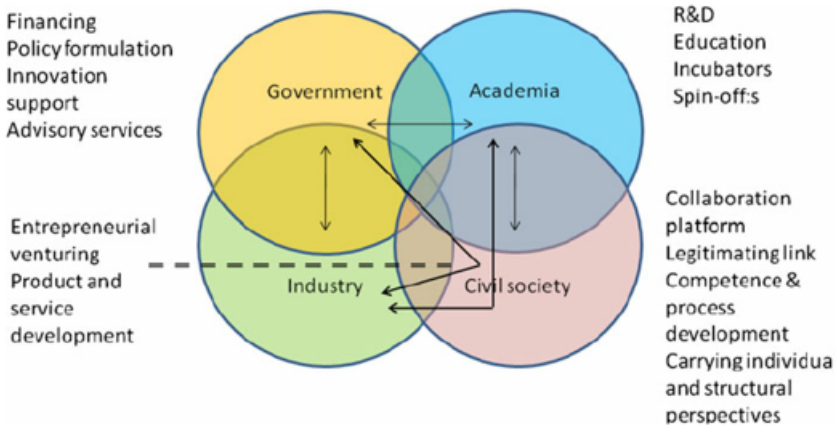
WP4: QH platform

This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant no 788503

- WP5- Audit of the centres for current RRI.
- WP6- Action plan for long term embedding of RRI in strategy
  - Select 2 interventions to trail in a 2 year pilot
- WP7- Implement the interventions
- WP8- Monitor and evaluate the interventions
- WP9- Long term implementation plan for remaining interventions in the Action plan

This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant no 788503

- WP4- Quadruple Helix



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Some conclussions of the SoA of projects review (D.3.1):
1) RRI is a complex and evolving concept:

•Business, RPOs,need to etablish its own conceptual RRI framework to be validated internally at the institutional level. It needs to be understood as a whole **approach and mind-set**, not *as a la carte* list of actions
•**a clear policy for stable careers for researchers and support staff (including women, junior and older staff**) is a prerequisite to RRI
•showcase RRI practices and tools and use clear examples adapted to every Quadruple Helix (QH) groups interests/language
•include internal and external consultations within the action plan co-design , monitoring and evaluation processes to ensure all stakeholders can contribute to the notion of RRI and make it evolve
•pay particular attention to R&I outcomes as to provide effective solutions to **societal challenges and show pilot actions** while implementing structural change to attract agents of change inside and outside the institutions
•design tailored and flexible actions plans with short, medium and long-term **(post-project**) objectives/initiatives

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2) RRI is a complex process requiring flexibility and long-term engagement with QH:

•Exemplar, one-fit-to-all practices do not exist
•Mind shift is required to institutionalized the involvement of other sources of knowledge/stakeholders i.e. for the co-designing of RPOs/RFOs R&I agendas and projects; not just one way, one time QH exchange.
•Self assessment needs to address all aspects of RRI as a whole
•Participatory process alone do not account for RRI, run away from the "post-it" workshops and ensure continuous public engagement leading to concrete outputs for societal benefit and share of knowledge

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3)The nature and culture of the institution/company/NGO and national STI context must be assessed for RRI strategies, especially for QH engagement , and to inspire national RRI policy instruments.

•Institutional and national STI contexts, including conceptualizations and implicit policies, need to be included in the initial audit as to identify blocks/opportunities for RRI (GO-SPIN UNESCO)

•RFOs and national policy organisations need to find interest to support the project (e.g. included in Advisory Board or invited to regular meetings at country level) in order to as to raise their awareness and design RRI policy instruments for the country/region

-Gender equality is a complex theme, where unconscious bias and implicit policy instruments can block RRI uptaken. It requires specific indicators, tools and expertise to go beyond parity and effectively address all four levels: institutional governance, career progression, work-life balance and Engendering knowledge.

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4) When addressing process barriers, there are a number of good lessons and practices to promote institutional awareness and mutual learning for transformational change.

•A number of tools to support the implementation of RRI as reflection workshops, thematic cafes are to be used

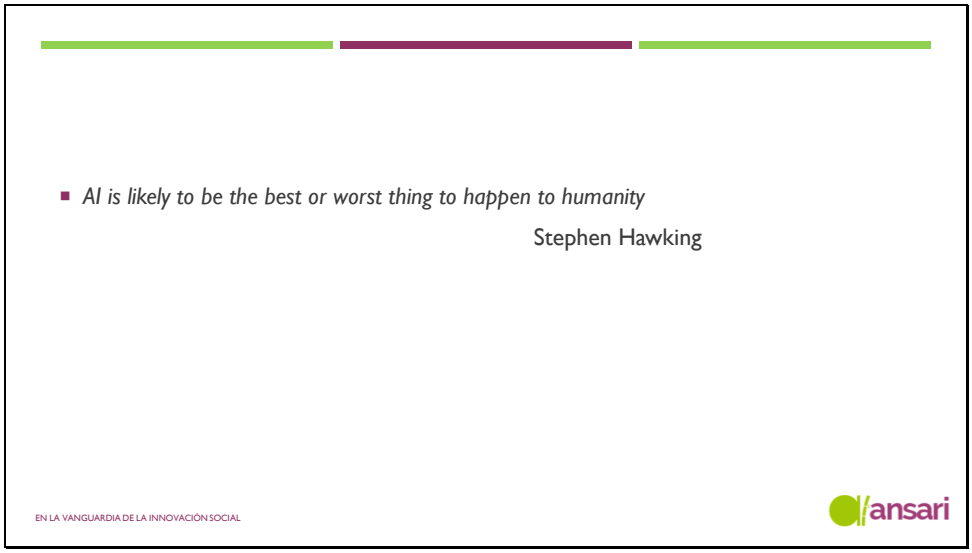
•Implementation teams at the institution level shall be diverse, balanced, have power to decide/give example and committed through-out the process

•Project technical assistance team and external advisory board can support with specific issues/missing expertise

•Internal project evaluation should support partners in a positive manner and not be used to control/ micromanagement partners actions

HELENA ANCOS FRANCO

Towards a governance of Artificial Intelligence and Robotics (INBOTS project)



- The use of algorithms and big data in automation processes and decision making **can have a significant impact on** people's lives. **The high level of feedback of technologies linked to artificial intelligence, makes them gradually acquire more technical autonomy and, consequently, increase their capacity for action and decision within the parameters established by the algorithms.**
- **The main danger posed by the development of artificial intelligence is to give the illusion that the future is controlled by calculation and algorithmic procedures respond to an uninterrupted sequence of direct responsibility of the human being.**
- In this context, the main task of the future regulation in the development of artificial intelligence is **that it be placed at the service of the human being, promoting inclusive and equitable social progress**, and also **avoiding supremacist positions** of some individuals against others and situations of abuse and manipulation

BUT NOTWITHSTANDING THE NEED TO REGULATE THE FUTURE IMPACTS OF ARTIFICIAL INTELLIGENCE

- Asymmetries in their knowledge and awareness of their impacts among society, experts, government authorities and industry,
- the objective of not diminishing innovation and competitiveness of a sector still in an incipient phase in many states,
- the lack of flexibility and agility of the regulatory mechanisms and processes, and the different capacity of advocacy of the stakeholders,

BUT WHY DO WE NEED REGULATION? WHAT ARE THE ETHICAL IMPLICATIONS OF BIG DATA, MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE)

- **First,** although **the availability of the computing infrastructure** with which to train AI models is no longer a significant barrier as before, several studies suggest that the **application of AI** could be uneven, with the division between countries and companies which in turn would have consequences on the short-term impact of AI on work, **creating an even wider gap, not only between high and low income workers, high and low technological qualification but also displacing many professions from the labor** market
- Another concern is **the use of covert artificial intelligence systems** that increase the risk of manipulation and control of the human being.

ENDOGENEITY OF DATA AND CONFLICT OF INTEREST

- Thirdly, **the endogeneity of data**, that is, that economic data exists because **someone, with adequate access and some type of model** in mind, considered them worthy of being captured.
- The endogeneity of the data also involves reflection on conflicts of interest. In other words, in data capture processes, **data must represent unbiased observations of an independent "real" world.**

ACCESIBILITY OF DATA FOR SOCIAL PURPOSES

- A particularly critical aspect related to the above is the **accessibility of the data and its application for social** purposes, which may constitute an important barrier to the use of AI for the common good.
- **Much of the data that is essential or useful for applications for the social good is in private hands or in public institutions with little willingness to share data. Obtaining access to this type of data sets by social entrepreneurs and NGOs can be difficult due to its commercial and strategic use, regulations on data use, privacy, or bureaucratic inertia**.

IMBALANCE BETWEEN SUPPLY AND DEMAND IN AI PROFESSIONALS

- The Mckinsey report, *Notes from the Frontier. Applying AI for Social Good*, points to another bottleneck: the imbalance between supply and demand **between AI professionals working for the commercial and social sectors.** The commercial sector has a greater capacity to attract talent in AI, **this has consequences not only in research but also in the resulting AI applications.**

THE DOMINANCE OF A MODEL CAN CONDITION THE FUTURE OF DATA

- **the dominance of a given economic model can condition the future use of the data and condition the potential of new 'species' of models (and the data they use) to penetrate the economic ecosystem.**
- This leads to ask the following question: ***how (if it can) data science produce models that retain validity when used to shape the predominant behavior on which the data is based?***

COUNTER-SERENDIPITY

- **AI can perpetuate, amplify or ossify the social status quo**. And this due to what has been called "counter-serendipity", the result of the fact that **AI systems are trained to replicate decision-making patterns**.
- **To the extent that an AI replicates past patterns of human decision-making, it also necessarily perpetuates existing social prejudices.**

AI CAN INCREASE LABOR PRODUCTIVITY AND EXACERBATE INEQUALITIES

- From a sociological and wealth distribution point of view, the *AI Now Labor Primer report* describes how automation based on machine learning and robotics have the potential both to increase labor productivity and to exacerbate existing inequalities in distribution of the same.
- In an economic context characterized by low productivity and high levels of inequality, a priority will be to find ways for the use of AI to promote equality and shared prosperity.

SURVEILLANCE OF WORKERS

- On the other hand, **the AI will also have other repercussions in the management of the work** and to the extent that **the data that it produces gives the businessmen increasing and often invasive data** on the behaviors of their employees at work.
- And **as the data increases, so will the surveillance practices and control over the workers**. This 24/7 surveillance has the potential to transform basic characteristics of management systems, in an unthinkable way for workers. Employers can easily use machine learning techniques to identify patterns of behavior both in working hours and outside of them, and take advantage of this data to increase benefits and manipulate behaviors, with the potential negative effect on workers.

DISCRIMINATION

- Indeed, **within the social impacts of Artificial Intelligence**, the **rights of equality and non-discrimination** are two of the most likely rights to be affected by the use of algorithms and machine learning systems, and **they are also determinants for access and enjoy many others**: privacy, data protection, freedom of expression, participation in cultural life, meaningful access to resources, provision of services and opportunities, medical care and education.
- For example, in cases where a member of an ethnic minority is less likely to be summoned to a job interview because the algorithm was "trained" based on data in which their particular group performs worse, that is, it has worse results than other groups.

WHAT SHOULD BE THE MAIN PILLARS OF A GOVERNANCE OF ARTIFICIAL INTELLIGENCE ?

- The challenges posed by artificial intelligence are **so broad i**n their thematic coverage, **so complex** in their implications and **so unpredictable** in the depth of their impacts, **that many of the existing formal and informal institutions are not adequate to address** the challenges posed by AI .
- Thus, we need a **certain degree of institutional innovation** to guarantee the governance of these technologies in society and to provide adequate accountability.
- While international human rights law has been invoked as a universally accepted framework for considering, evaluating and, ultimately, correcting the impacts of artificial intelligence on individuals and society, its low **effectiveness and flexibility to adapt to a rapidly changing system, requires the participation of the private sector and other mechanisms.**

- **In some countries such as France or the United Kingdom, multidisciplinary commissions** are already being created to open a political debate on the social and political implications of artificial intelligence.
- The contribution of the private sector to the debate has borne fruit in a wide panoply of declarations of principles that cover both **the research phase** in AI, **algorithm design** and **commercialization**, as well as its exploitation.
- From **the Asilomar Declaration for an ethical investigation in Artificial Intelligence**, through the FAT / ML **Principles for Responsible Algorithms**, the **IEEE Global Initiative on Ethics of Autonomous** and Intelligent Systems, the **Montreal Declaration for a responsible development of Artificial Intelligence**; until the recent **Guide to ethical principles in AI** prepared by the group of high experts of the European Commission, **a soft law corpus has been established with a minimum consensus** on the principles that will govern the life cycle of artificial intelligence.

- **As common characteristics to these statements**, we can highlight the following:
- **Concern about the possible negative impacts** of the development of artificial super-intelligence that may exceed the limits of human control, on the one hand, and **the possible harmful uses of particular developments,** such as lethal weapons or the indiscriminate use of data beyond knowledge and human consent.
- Some of them represent a more advanced stage, halfway between the declarations of principles and the regulation, **establishing some tests or check-lists that operate as compliance or risk management systems in artificial Intelligence.**

BUT…

- However, despite **acquiescence about basic elements such as human responsibility, transparency, auditability**, or the search for the common good, there are **two worrying elements**:
- On the one hand, the **eviction of an effective development of the precautionary principle** as a colorarium of the principle of human control and supremacy of man over the machine.
- Secondly, **the absence of any intention to regulate even critical aspects such as contingency plans for damages arising from the misuse of AI, prior declarations of impact before the product is placed** on the market, **minimum transparency requirements** or **some exceptions to voluntariness**.

THE EVOLUTION TOWARDS A GOVERNANCE SYSTEM BASED ON CO-RESPONSIBILITY

- The first step towards effective governance would be marked by a **system of shared responsibility where public and private actors will observe the principle of due diligence**.
- The principle of diligence is a principle of private law that refers to the performance with a certain standard of care but which has been generalized especially in relation to respect for human rights by companies following its introduction by the United Nations Guiding Principles on Business and Human Rights ("UNGP" or "Guiding Principles")

- Due diligence in the field of human rights **is generally understood in relation to those tools or measures** through which **companies can identify, prevent, mitigate and account** for the negative impacts on human rights of their activities or those derived from its business relationships, which usually include the activities of its subsidiaries, subcontractors, suppliers and other series of actors with whom the company establishes economic transactions.
- The application of due diligence in both companies and government entities implies:
- • **The analysis of the activities, products and services of the entity in order to identify possible risks to human rights.** That is, the entity must assess whether its operations, of whatever type, pose a risk to human rights. This analysis will include not only direct activities (those carried out by the entity itself) but also indirect activities (those carried out by others linked to it).

- **Once these risks have been identified, the entity must implement a series of measures so that those risks do not materialize,** for example, offering specific training in human rights to those employees who have more capacity to influence them negatively, establish analysis of compliance with a series of social standards to suppliers prior to hiring, the imposition of certain behavioral obligations on employees and third parties.
- **Once these measures are implemented**, the entity must **review and ensure compliance with evaluation processes** such as audits, review of compliance with social contractual clauses, etc.
- Depending on the results of these reviews, **the entity must take measures to improve the processes and to eliminate the risks it has detected.**
- The entity must **have measures in place to repair possible negative impacts** on human rights that may occur, including, and as a pre-repair measure, the company must establish operational mechanisms that allow anyone to channel a claim or a complaint about certain corporate behavior that is causing a violation of your rights.

THE TORONTO DECLARATION

- The Toronto Declaration represents a qualitative step in defining the protection framework in the field of AI, and an instrument **halfway between voluntariness and regulation** and the application to artificial intelligence of the foundations of the United Nations Guiding principles on Business and Human Rights.
- The center of the declaration is **the shared responsibility in its protection by States and companies: all actors, public and private, must prevent and mitigate the risks of discrimination in the design, development and application of machine learning technologies**. They must also ensure that there are mechanisms that **allow access to an effective solution** before implementation and throughout the system life cycle.

- Alongside this, **corporate responsibility is justified by the fact that the research and development of machine learning systems are largely driven by the private sector**, in practice states often rely on private contractors to design and Implement these technologies in a public context.
- In such cases, **states not only must not give up their own obligations around preventing discrimination and guaranteeing responsibility and reparation for damages** to human rights in the provision of services **but also must maintain relevant supervision and control on the use of the AI system**, and require the third party to execute due diligence in the field of human rights to identify, prevent and mitigate discrimination and harm to other human rights, and render public accounts for their efforts in this regard.
- In line with this co-responsibility, **the declaration distinguishes between state obligations and private sector obligations.**

RESPONSIBILITIES OF PUBLIC SECTOR ACTORS

- **States must adopt mechanisms to mitigate and reduce the damages** of machine learning discrimination in public sector systems:
- 1. **Identify risks.** Any state that implements machine learning technologies should thoroughly investigate possible discrimination and other rights risks, before development or acquisition, when possible; before use, and continuously throughout the life cycle of technologies, in the contexts in which they are deployed.
- **Perform regular impact assessments before public procurement**, during development, at regular milestones, and throughout the deployment and use of machine learning systems to identify potential sources of discriminatory results or other rights harms (for example , in the design of an algorithmic design model or in data processing).

- 2. **Ensure transparency and accountability**
- 3. **Enforce supervision**
- States must take measures to ensure that public officials know and are sensitive to the risks of discrimination and other damage to rights in machine learning systems. In this way, states must:
- a) *Proactively adopt hiring practices and participate in consultations* to ensure diverse perspectives, so that those involved in the design, implementation and review of machine learning represent a variety of backgrounds and identities.
- b) *Ensure that public bodies carry out training in human rights and data analysis* for officials involved in the acquisition, development, use and review of machine learning tools.
- c) *Create mechanisms for independent supervision*, including by judicial authorities when necessary.
- d) *Ensure that decisions supported by machine learning comply with accepted international standards* for due process.

- **The due diligence process**, established in the United Nations Guiding Principles on Business and Human Rights, implies that private sector actors who develop and implement machine learning systems must adopt proactive and reactive measures to ensure that they do not cause or contribute to abuse against human rights through the use of their systems.
- There are three basic steps in the due diligence process regarding human rights:
- i. Identify possible discriminatory results
- ii. Take effective measures to prevent and mitigate discrimination and monitor responses
- iii. Ensure transparency in efforts to identify, prevent and mitigate discrimination in machine learning systems and identify possible discriminatory outcomes
- Along with this, and in line with the Guiding Principles, the statement establishes the precautionary principle: that is, when the risk of discrimination or other rights violations is considered too high or impossible to mitigate, private sector actors They should not implement a machine learning system in that context.

- The right to an effective remedy.
- Finally, **companies and private sector actors** who design and implement machine learning systems must take measures to ensure **that individuals and groups have access to significant and effective resources and repairs**. This may include, for example, the creation of clear, independent and visible processes for reparation after individual or social adverse effects, and the designation of roles in the entity responsible for the timely remedy of such problems subject to accessible judicial reviews and appeals. and effective.

TO SUM UP

- **Artificial Intelligence needs a governance system based on a shared responsibility by States and private actors, that could**
- i. Strengthen the legitimacy of proposals for responsible artificial intelligence, by incorporating the initiatives of private actors;
- ii. Collectively arbitrate ethical and social controversies about AI when conceived as open, revisable and adaptable processes according to the evolution of knowledge and techniques, and feedback on the use of artificial intelligence in society.
- iii. improve the quality of thinking about responsible artificial intelligence by presenting the vision of experts and specialized groups.

The era of our intelectual superiority is ending. As a species, we need to plan for this paradigm shift.

Whether intelligent machines will learn from the darkest parts of our human nature, or the noblest, remains to be seen.

EN LA VANGUARDIA DE LA INNOVACIÓN SOCIAL

THANK YOU!

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EN LA VANGUARDIA DE LA INNOVACIÓN SOCIAL


En la vanguardia de la sostenibilidad
CONSULTORÍA ESTRATÉGICA
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ansari

ÁLVARO FALCÓN PULIDO

Tax incentives as a way to promote RRI in robotics (INBOTS project)

TAX INCENTIVES: WHY AND HOW?

Purpose

- R&D is an economic activity which will **benefit society** in the sense of scientific and technical progress
- and will give an economic advantage to the producer and distributor of the results of that activity

Means

- Direct and indirect financing
- Direct and indirect tax incentives
- Input and output incentives

TAX INCENTIVES IN THE SPANISH CORPORATE TAX

- Patent Box
- R&D and technological innovation credits
- Free depreciation

TAX INCENTIVES IN R&D IN OTHER COUNTRIES

Input Incentives

- France
- Austria
- Netherlands
- Chile

Output Incentives

- France
- Portugal
- United Kingdom
- Italy

TAX INCENTIVES AND TAXATION ON ROBOTS

- Investment in R&D+i is considered as the key to productivity and growth, thus constituting the basis of a country's progress and social welfare
- R&D+i in the field of robotics is of special importance, since robotics cannot exist without it
- Taxes on robots are ways to collect money and try to mitigate the consequences of the robots and research
- The Korean model of robot tax has basically consisted of lowering or suppressing the tax benefits of technological innovation

PROMOTING RRI IN ROBOTICS

- It may be better to tie tax incentives to objectives on employment, public engagement, open access, gender equality, science education, ethics, and governance, environmental protection, etc.
- Transforming tax incentives for research and development into tax incentives on RRI
- We use existing tax incentives as a benchmark, such as tax deductions for job creation and tax deduction for job creation for workers with disabilities, but aiming promote an R&D which strive towards sustainable, ethically acceptable, and socially desirable outcomes

USE OF TAX INCENTIVES AND SELF-COACHING TOOLS FOR RRI

- Self-coaching in RRI through the use of tax incentives
- Incentivize the design of these RRI tools
- Link SDGs

Q&A

Thank you for your attention

INBOTS - Inclusive Robotics for a Better Society (G.A. No. 780073)

http://inbots.eu alfalcon@ucm.es

MOHAMAD NADIM ADI

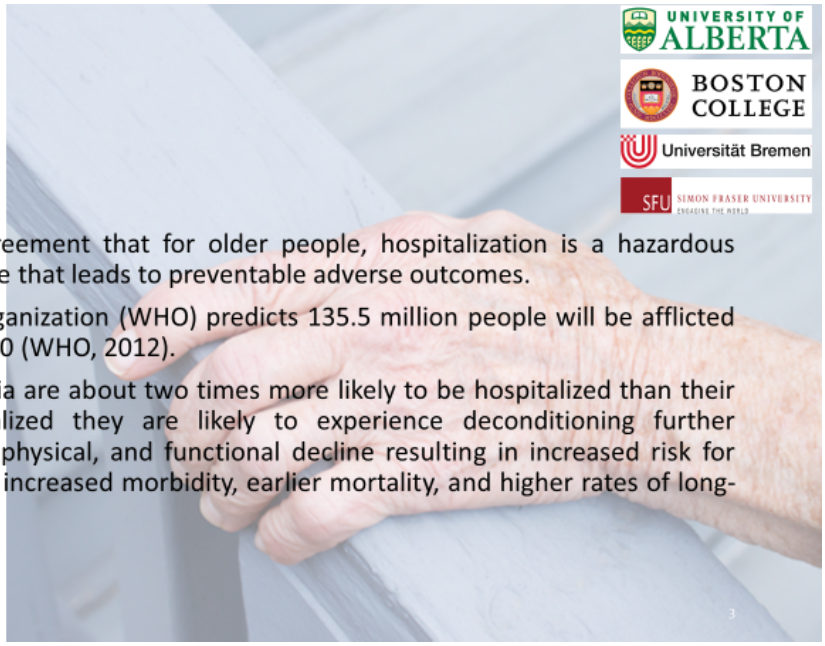
Towards inclusive design, exploring dementia-friendly hospital design in Canada

Introduction

- What do you picture when thinking of a hospital? Mostly spaces designed around medical staff to deal with urgent patients.
- Rarely do we think of long-term patients, particularly elder ones.
- Hospitals are facilities where people receive treatments for acute health conditions from an interdisciplinary team of practitioners.

2

Introduction



- There is growing agreement that for older people, hospitalization is a hazardous health care experience that leads to preventable adverse outcomes.
- The World Health Organization (WHO) predicts 135.5 million people will be afflicted with dementia by 2050 (WHO, 2012).
- Persons with dementia are about two times more likely to be hospitalized than their peers. Once hospitalized they are likely to experience deconditioning further enhancing cognitive, physical, and functional decline resulting in increased risk for hospital readmission, increased morbidity, earlier mortality, and higher rates of long-term care placement.

3

RRI in design

- Architecture should uplift and make people feel better.
- As we approach a new phase of society (5.0) where cyber space and physical space seem to merge, there is a growing demand for user-based design.
- There are physical safety standards for architecture.
- No mental or psychological safety standards.
- With that in mind there must be ethical standards for design.
- To do that we must have a way to evaluate design that involves end users.

4

Why is it important?

- Architecture has always been an important element in social life.
- In architecture, the architect depends on his experience when trying to design and produce a building.
- Knowledge of materials, space and building methods is gained through observation and experience gained from sometimes disastrous trial and error.
- The client is usually buying into a product that they cannot fully understand until it is constructed in real life.
- Successful and famous architects designed wonderful buildings that were bad for living.

5

Virtual Reality as a Test Environment

- Relatively cheap
- Reactions in Virtual Reality environments are realistic and like real life
- It can support multiple users

6

Strategy

- Forming an international advisory committee of experts in the fields of architecture/design, gerontology, hospital care, and dementia.
- The past 20 ears of literature, a total of 12837 items (papers, studies, projects) were evaluated. In total, 607 items (empirical *n* = 428; gray literature *n* = 179) underwent a two-reviewer assessment. Through our exclusion criteria only 28 items were found to be suitable.
- Define the important characteristics of the aged that have to be accommodated by those environments.

7

Data Bases and Literature

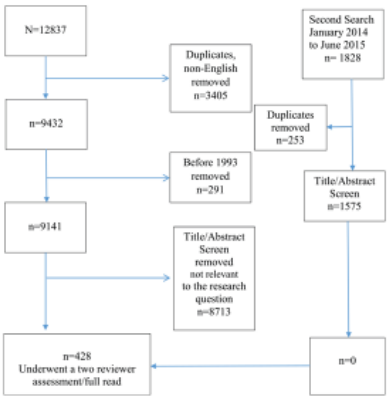


Figure 1. Empirical literature flow chart diagram.

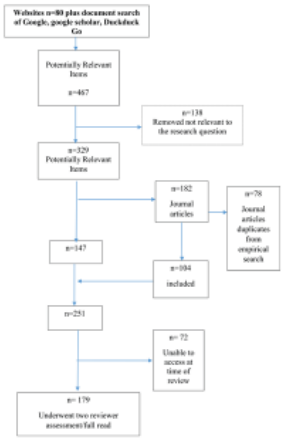


Figure 2. Gray literature flow diagram.

Table 3. Academic Databases Searched

Databases	
Health sciences	**Year parameter**
Ovid Medline	1946 and in process and nonindexed citation
Ovid Embase	1974–
Ovid PsycINFO	1806–
EBSCOhost CINAHL	1937–
Engineering	**Year parameter**
Engineering Village Inspec	1896–
Engineering Village Compendex	1894–
Design and architecture	**Year parameter**
EBSCOhost Academic Search Complete	No year parameter in data
Scopus	1823–
Proquest	1973–
Design and Applied Arts Index	**Year parameter**
Avery Index to Architectural Periodicals	1934–
Multidisciplinary	**Year parameter**
Web of Science	
Science Citations Index	1898–
Social Sciences Index expanded	1899–
Conference Proceedings Citation Index -Science	1990–
Conference Proceedings Citation Index-Social Sciences & Humanities	1990–
Business	**Year parameter**
EBSCOhost Business Source Completed	Searches in business databases retrieved no relevant items
ProQuest ABI Inform	Searches in business data bases retrieved no relevant items

8

Discussion

- Healing environments in health care are rooted in evidence-based design solutions that contribute to efficiency and cost savings.
- This must extend to acute care physical design solutions that protect and maximize functional abilities in age sensitive ways.
- The level of adoption of design suggestions found in literature for hospitals is still unclear.

9

Results

- A total of 28 primary studies plus expert reviewers' narratives on the impact of design and architectural features on independent function of hospitalized older people with dementia were included and evaluated.
- Items were mapped to key design elements to describe a D-FAC environment.
- This scoping review project confirms the limited nature of available acute care design evidence that will:
  - Foster confidence, autonomy, independence in activities of daily living.
  - Promote harm reduction by facilitating safe mobility, reducing stress and anxiety, supporting cognitive ability, and enabling restful sleep.
  - Facilitate family contact and caregiving.

10

Implications

- Physical design influences the usability and activity undertaken in a health care space and ultimately affects patient outcomes.
- Achieving safe quality hospital care for older people living with dementia is particularly challenging.
- Evidence of design principle effectiveness is needed that can be applied to general medical and surgical units where the bulk of older persons with and without dementia are treated.

11

Conclusion

Understanding how design elements influence functional abilities in older people living with dementia is important if we are to create hospital spaces that promote health, healing, and well-being, while reducing the risk for harm and injury. Greater focus on D-FAC design is needed to ensure quality and safety for older people in hospital.

12

Rehab and Patient Treatment

13

Thank You

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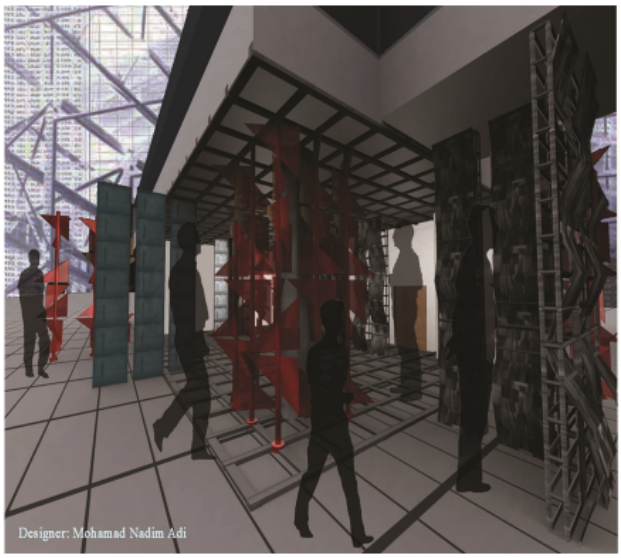
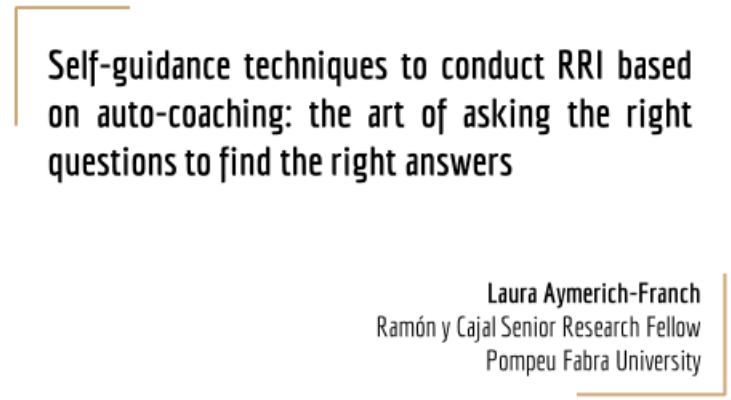


LAURA AYMERICH-FRANCH

Self-guidance techniques to conduct RRI based on auto-coaching: The art of asking the right questions to find the right answers



We know that it has several dimensions...

Inclusion

Anticipation

Reflection

Responsiveness

Transparency

Very well, but...

Are we offering researchers what they *really* need to conduct RRI?

What's the matter...?

- The principles that define RRI provide a suitable framework to discuss about the topic.
- However, the really challenging aspect is **HOW** to implement them in everyday R&I practices, specifically.

Coaching

- Coaching is a process of accompanying people so that they achieve change in the desired direction.
- Coaching does **not** believe in giving advice: the person has the answers they need to achieve their goals inside them.

Why can coaching inspire us to guide RRI?

Coaching is about...	In RRI...
Learning to revise our reasoning processes to achieve personal growth	We expect personal growth from researchers in their roles: We expect researchers to "reach the next level" in they way they conduct research, we want them to do things differently.
Learning how to be accountable for our actions and to take reasoned decisions about our behavior	We expect accountability from researchers when they conduct their research

Why can coaching inspire us to guide RRI?

Coaching is about...	In RRI...
Producing positive change in the person	RRI aims at positive change in the research sphere and, by doing so, in the society in general
Using language as a powerful tool for transformation, interestingly, never through advice or instructions!	It can provide us alternative tools to writing mandates or giving advice

How does coaching achieve change?

wandering thoughts › specific goal › action plan

through the art of asking the right questions

How does coaching achieve change?

- *Finding the right answers is about **asking the right questions***, which is crucial to achieve change.

- Coaches do not use advice or mentoring, the person finds the solution by themselves when the right questions are asked.

How does coaching achieve change?

- What specifically do you want to achieve?
- What could you do differently?
- What else can you try?
- (What do they think) Did you actually ask them?
- Who can help you with that?

It is about making everything in our mind concrete and specific, verifying every thought, so that, progressively, the wandering thoughts become a clear and focussed goal

Join Activity:
Self-guidance tool for RRI with SOCIAL ROBOTS

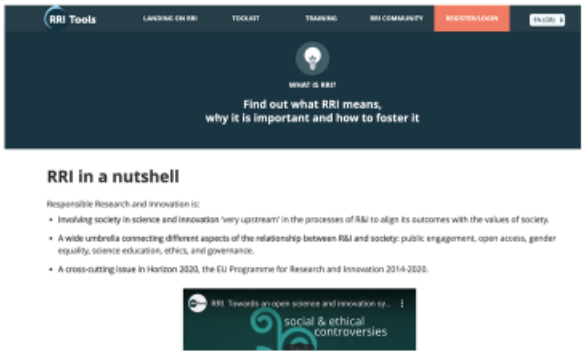
- We propose developing a **self-guidance tool** based on a series of **critical questions related to each of the five RRI principles,** following the coaching principle that **finding the right answer is about asking the right question.**

- Our goal is that **researchers and innovators can use the tool to guide their R&I processes throughout all the stages.**

- We expect that, by reflecting and answering these questions, researchers and developers will **empower themselves/become accountable** to conduct research in the field social robots responsibly, without the need to receive mandates.

We are actually not doing anything new...

Very good examples for RRI in general:



Our aim is to design this tool by consciously using the strengths of coaching and for conducting RRI with Social Robots specifically

Some tips...

- Use Wh-questions: What, how, when, who, where...
- Further exploration if "yes / no" question: how *exactly*? what *else*? -› Insist to achieve specificity.
- Put emphasis on making the person accountable for every action.
- Make them evaluate different options.

Some tips...

- People tend to make a lot of assumptions: make them verify everything and help them distinguish assumption from objective facts.
- People tend to do mind reading, rather than asking directly: make them ask the right person to *really* know what is going on.

Some tips...

- People tend to avoid asking for help even when it benefits them: make them realize its benefits.
- People tend to have lots of fears: challenge them!